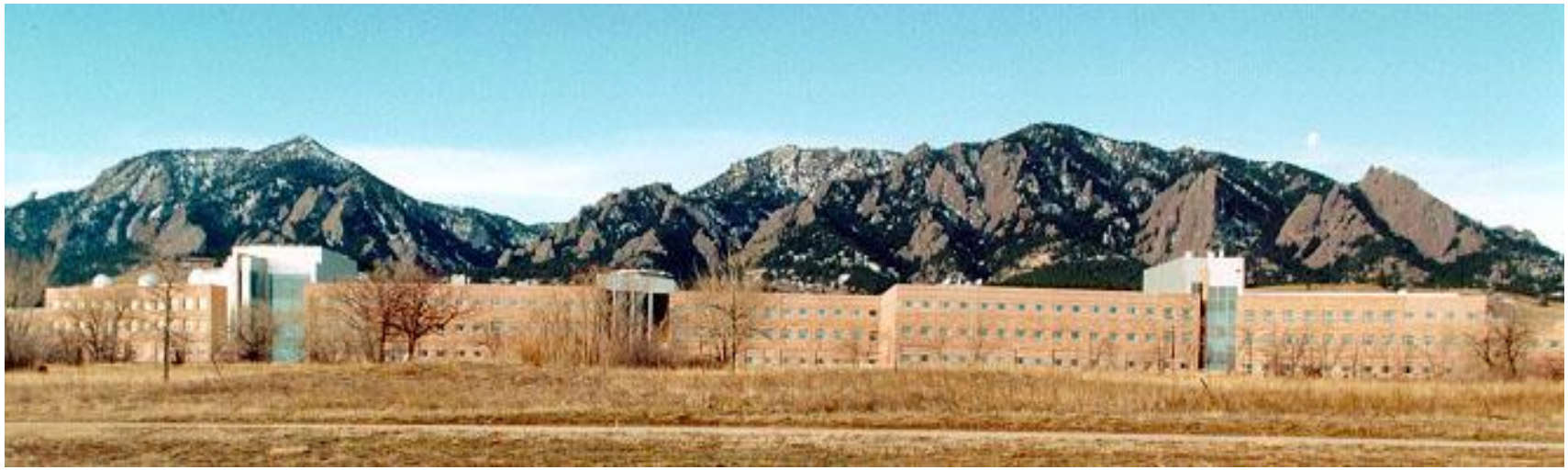


STP Quarterly Review

10 Jul 2012

3QFY12

William Denig

Solar & Terrestrial Physics Division

NOAA/NESDIS/NGDC

303 497-6323

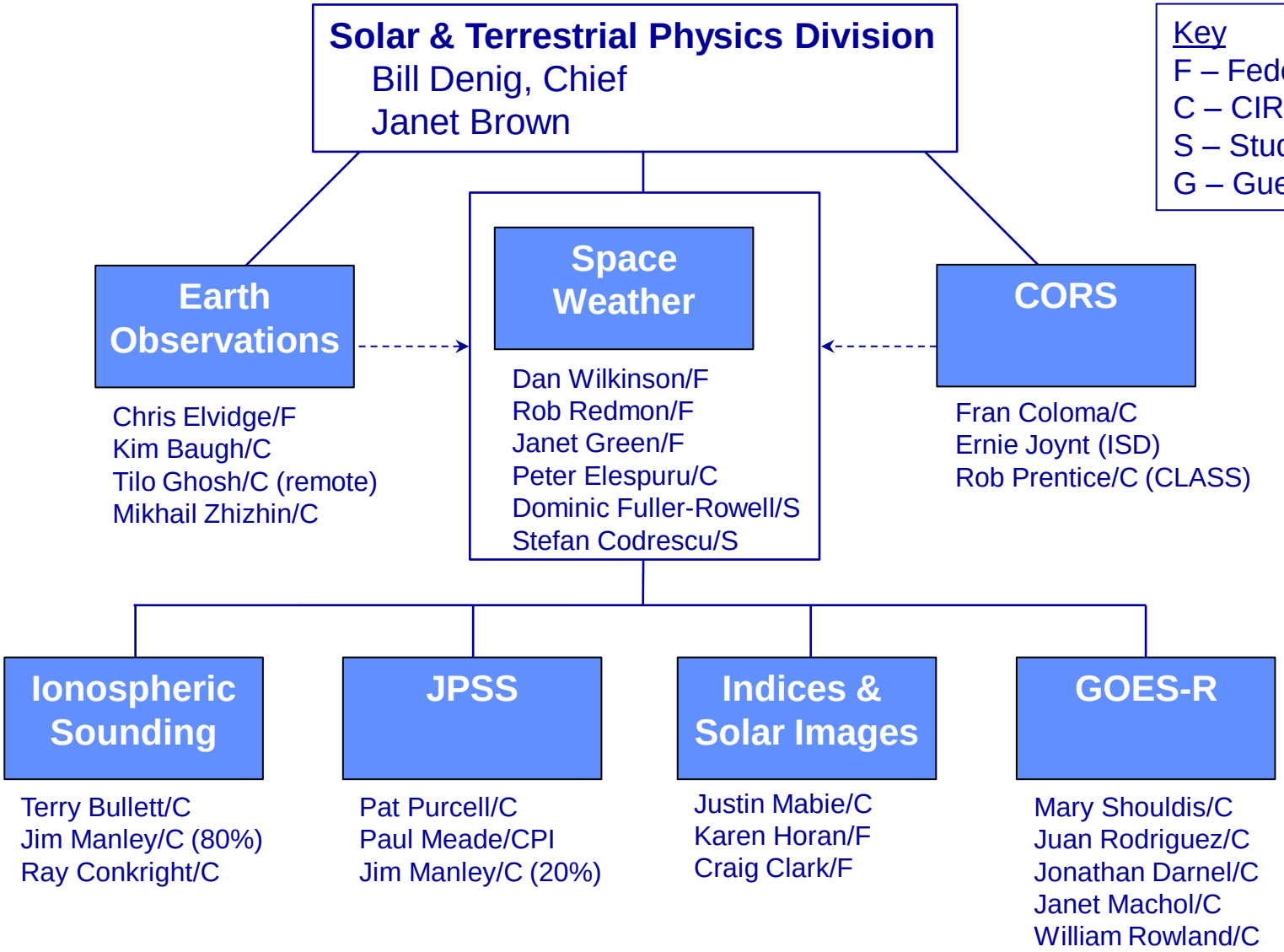
William.Denig@noaa.gov

OUTLINE

Solar & Terrestrial Physics Division

- **STP Division Overview**
- **Milestones & Performance Measures**
- **Personnel Activities**
- **Accomplishments & Updates**
- **Issues & Summary**

STP Division Overview
Personnel



STP Division Overview
Personnel Changes

- Gains
  - Jenny Mills (Northwestern University) – Hollings (Redmon) – DMSP
  - Ranjeetha Bharath (MIT) – Hollings (Rodriguez) – SEP Events
  - Feng (David) Chi Hsu (CIRES) – DMSP Nighttime Lights
  - Mikhail (Misha) Zhizhin (CIRES) – VIIRS Nighttime Lights
- Losses
  - Sharolyn Anderson – Faculty position at University of South Australia
  - Preeti Bhaneja – Completed 2-yr post-doc (Ionosondes)
- Reassignments
  - Anu Sundaravel, Switched to hourly, webpage development
- Inbound
  - Radhika-Chandrakant Shetye – CIRES PRA, EOG
- Vacancies (Federal Vacancies)
  - Space Weather Physicist – Solar Program/SXI-SUVI
  - Information Technology Manager – Need to backfill Peter
- Outbound
  - Peter Elespuru, New horizons in California

STP Division Overview
Agreements – Status

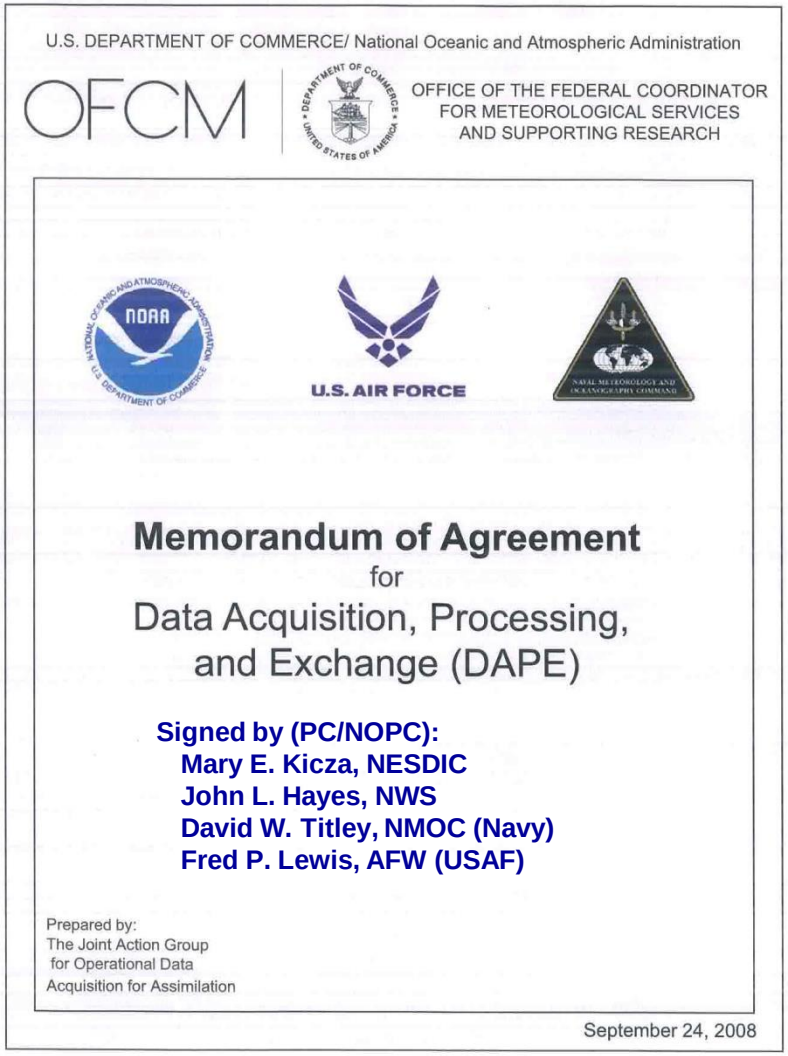
Agreements

Scope	Team	Type	Partner	NOAA Legal	DOC Legal	NGDC Signed	Partner Signed	Start	End	Status	
CORS Support	CORS	AGR	NGS	n/a	n/a	X	X	10/01/2003	09/30/2013	G	In place - IC complete
SWx Climatology	SWX	MOU	AFCCC	X	X	X	X	05/27/2004	10/01/2014	G	In place - no FY12 activity
GPS Data (CORS)	SWX	MOA	Multi	n/a	n/a	X	X	09/20/2004	TBD	G	*Biannual Review - waiting on NGS*
DMSP Archive	NTL	MOA	DMSP	X	X	X	X	05/30/2007	09-30/2009	G	*In process - Blanket MOA*
Ionosonde Sites	SWX	IA	USGS	X	X	X	X	04/03/2009	04/03/2014	G	In place - FY12 site support
ViRBO	SWX	MOA	NASA	X	X	X	X	04/15/2009	n/a	G	In place - no FY12 activity
SEM-N - AFRL	SWX	MOA	AFRL	X	X	X	X	05/11/2009	05/11/2014	G	In place - DWSS cancelled
Nighttime Lights	SWX	MOU	DOE	X	X	X	X	08/12/2009	08/12/2013	G	In place - nothing to report
NASIC	NTL	MOU	NASIC	X	X	X	X	03/09/2011	01/30/2015	G	In place - nothing to report
Gas Flaring	NTL	SA	WBank					05/22/2012	06/30/2013	G	*New*
Global CO2	NTL	AGR	NASA	n/a	n/a	n/a	n/a	07/29/2011	09/30/2012	G	In place - Space Act (1958)
SEM-N Algorithms	SEG	MOU	SMC	X	X	X		08/01/2011	07/31/2013	G	In place - DWSS cancelled
Outage Detection	NTL	MOU	NPS	X	X	X	X	10/28/2011	07/30/2012	G	In place - nothing to report

7/8/2012

G	No Action Needed
Y	Watch Item
R	Action Required

STP Division Overview
Renewing AFWA-NGDC MOA


U.S. DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

OFCM

OFFICE OF THE FEDERAL COORDINATOR FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

U.S. AIR FORCE

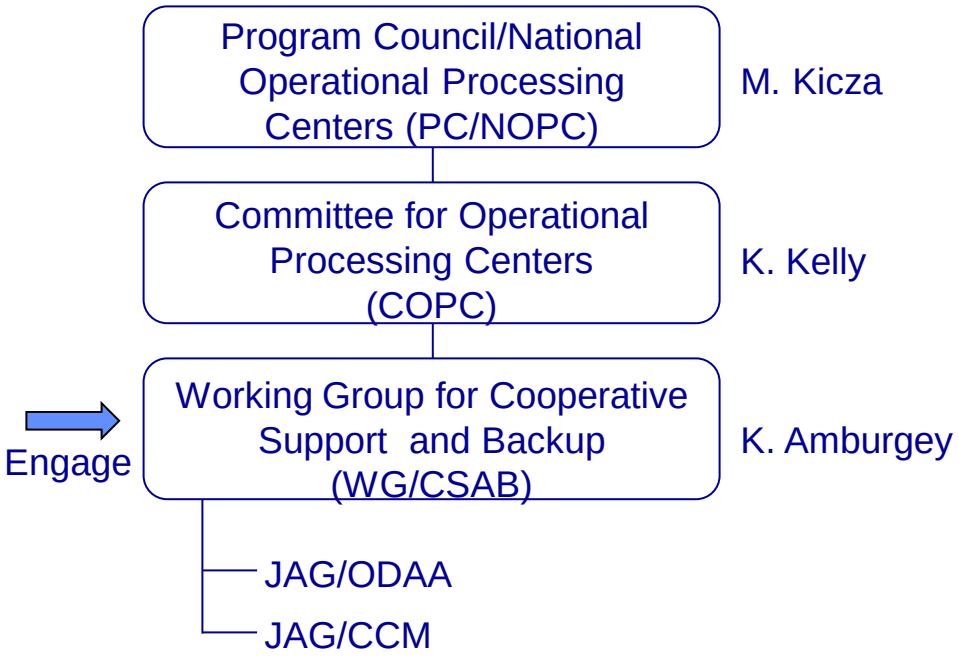
Memorandum of Agreement
for
Data Acquisition, Processing, and Exchange (DAPE)

Signed by (PC/NOPC):
Mary E. Kicza, NESDIC
John L. Hayes, NWS
David W. Titley, NMOC (Navy)
Fred P. Lewis, AFW (USAF)

Prepared by:
The Joint Action Group for Operational Data Acquisition for Assimilation

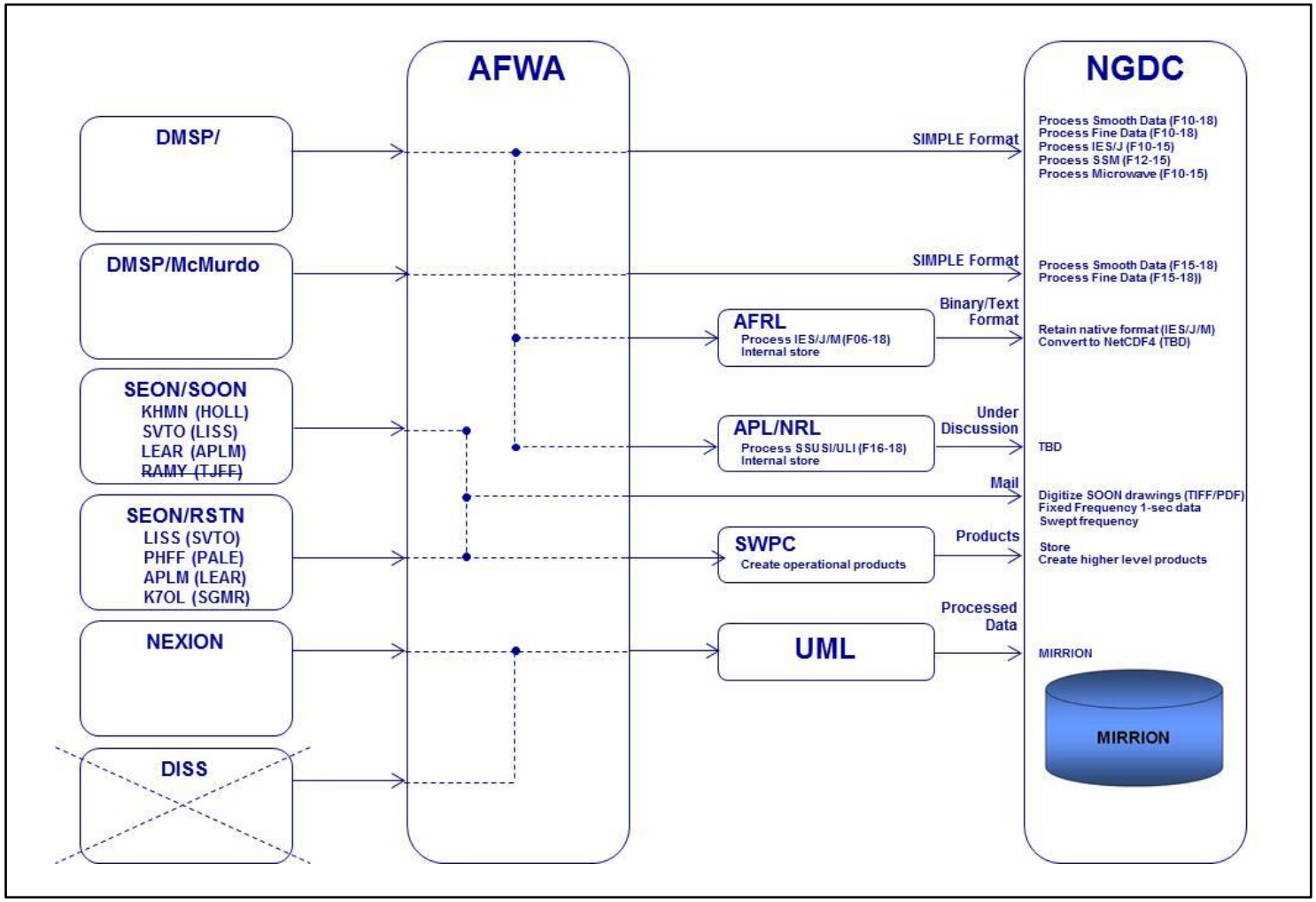
September 24, 2008

The existing MOA-DAPE provides an appropriate vehicle for a renewed agreement between AFWA and NGDC for the AAA of USAF satellite and space weather datasets. W. Denig is working with Mr. Ron Dunic to better define AFWA's needs and NGDC's capabilities.



STP Division Overview
SWx Data Stewardship Annex[1]

AFWA Data Flows to NGDC (Including DMSP)



[1]To the MOA on Data Acquisition, Processing and Exchange

STP Division Overview
Balance Sheet – FY12

Income

	FY11 Carryover	FY12 Funding	Total	
Base Allotment		$1,201,576.00	$1,201,576	
GOES-R (PN76)		$412,500	$412,500	
GOES-R (PN77)		$300,000	$300,000	
GOES-R Cal/Val		$121,292	$121,292	
CORS-West		$198,000	$198,000	
SEM-N	$160,000		$160,000	
JPSS Proving Ground		$97,000	$97,000	
JPSS Cal/Val		$53,000	$53,000	
NPS (DHS)		$198,909	$198,909	
NASIC		$100,000	$100,000	
NASA - ASU	$25,000	$25,000	$50,000	
DMSP McMurdo	$20,000	$72,000	$92,000	
World Bank		$31,000	$31,000	
NTL Data Sales		$45,717	$45,717	
Total Income	$205,000	$2,855,994	$3,060,994	**$3,060,994**

Expenses

	FY11 Carryover	FY12 Funding	Total	
OD Overhead	$20,500	$165,442	$185,942	
Salaries		$2,423,709	$2,423,709	
Travel		$80,743	$80,743	
Miscellaneous		$153,607	$153,607	
Total Expenses	$20,500	$2,823,501	$2,844,001	**$2,844,001**

Balance Sheet

	FY11 Carryover	FY12 Funding	Net	
Balance Sheet	$184,500	$32,493	$216,993	**$216,993**

Notes

-FY12 Salaries from Pica spreadsheet minus salary corrections

-FY12 Travel from STP approved travel minus STP base allowance

-FY12 Miscellaneous from Pica spreadsheet

STP Division Overview
GOES Spacecraft/Instrument Status

Spacecraft	Series	Operational Status	Status	Magnet1	Magnet2	Magnetometer 1	Magnetometer 2	MAG	XRS	XRS-EUV	EXIS	EPS	HEPAD	SEISS	XRP	SXI	SUVI
GOES 8	GOES I-M	Decommisioned	R	G	G				G			G	G		G		
GOES 9	GOES I-M	Decommisioned	R	G	G				G			G	G		G		
GOES 10	GOES I-M	Decommisioned	R	G	G				G			Y	G		G		
GOES 11	GOES I-M	Decommisioned	R	G	G				R			G	G		R		
GOES 12	GOES I-M	South America	G	G	G				R			Y	G		R	R	
GOES 13	GOES N-O-P	Operational East	G			G	G			Y		G	G			Y	
GOES 14	GOES N-O-P	On-orbit Storage	G			G	G			G		G	G			G	
GOES 15	GOES N-O-P	Operational West	G			G	G			G		G	G			G	
GOES R	GOES R	Acquisition						TBD			TBD			TBD			TBD
GOES S	GOES R	Acquisition						TBD			TBD			TBD			TBD

As of: 01 Jul 2012

Operational (or capable of)	G
Operational with limitations (or Standby)	Y
Operational with Degraded Performance	O
Not Operational	R
Status Unknown	TBD

Note: SWPC operations use GOES-15 SEM & SXI. GOES-13 SEM (no XRS; no SXI) are also used for SWPC operations. All available GOES and POES Space Weather data flowing into NGDC.

STP Division Overview

STP Annual Data Ingest[1] – 3QFY12

	CY10 GB	CY11 GB	CY12 YTD
GOES SEM	71	71	35
GOES SXI	870	1,731	878
POES SEM	30	29	14
DMSP OLS	5,000	5,760	1,440[2]
CORS GPS	20,198	24,456	11,321
Ionosonde	1,400	900	324

[1]Uncompressed data volumes
[2]Estimate

OUTLINE
Solar & Terrestrial Physics Division

STP Division Overview

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Milestones & Performance Measures

FY12 AOP Milestones

Primary NGSP Goal: Objective	Performance Measures / Milestones (NOTE: Do not report Measure or Milestone Targets in the same row)					Measure or Milestone Targets (NOTE: Do not report Measure or Milestone Targets in the same row)												Milestone Progress		
		Select any																		
	Measures/Milestone	GPRA	NOAA BSC	LO/SO BSC	HPPG	10	11	12 Q1	12 Q2	12 Q3	12 Q4	13	14	15	16	17	18	Planned/ Actual Completion	Status	POC
Weather:Environmental Information	Complete the historical data rescue of daily H-alpha solar images from the NOAA Boulder Observatory (1967-1994)							X										31-Dec-11	C	K. Horan
Weather:Environmental Information	Archive interplanetary data simulation runs for the Enlil operational space weather model per NWS request								X									31-Mar-11	C	W. Denig
Coastal:Marine Transportation	Achieve Initial Operating Capability (IOC) for disseminating in real-time satellite data received via McMurdo Station in compliance with the Antarctic Treaty									X								30-Jun-12	C	S. Anderson
Weather:Environmental Information	Develop in-house capability to process NOAA POES Space Enviroment Monitor (SEM) data for satellite operations										X							30-Sep-12	Y	J. Green
Weather:Environmental Information	Complete Phase 3 Preliminary Design Reviews for GOES-R Level 2+ space weather algorithms										X							30-Sep-12	G	M. Shouldis
Weather:Environmental Information	Maintain > 95% of availability of Space Environment Monitor (SEM) satellite data archived on an annual basis					>95	100%	95	95	95	95	95	95	95	95	95	95	1QFY12 2QFY12 3QFY12 4QFY12	100% 100% 100% '	D. Wilkinson
Coastal:Marine Transportation	Acquire, process, and disseminate >95% of available real-time nighttime lights imagery within 3 hours of receipt					>95	100%	95	95	95	95	95	95	95	95	95	95	1QFY12 2QFY12 3QFY12 4QFY12	100% 100% 100% '	C. Elvidge
Weather:Environmental Information	Provide a > 95% availability for Continuously Operating Reference Station (CORS) near real-time data to to the NWS Space Weather Prediction Center					>95	100%	95	95	95	95	95	95	95	95	95	95	1QFY12 2QFY12 3QFY12 4QFY12	100% 100% 100% '	F. Coloma

As of 01 Jul 2012

Milestones & Performance Measures

FY12 AOP Milestones

Primary NGSP Goal: Objective	Performance Measures / Milestones (NOTE: Do not report Measure or Milestone Targets in the same row)	Select any				Measure or Milestone Targets (NOTE: Do not report Measure or Milestone Targets in the same row)												Milestone Progress		
	Measures/Milestone	GPRA	NOAA BSC	LO/SO BSC	HPPG	10	11	12 Q1	12 Q2	12 Q3	12 Q4	13	14	15	16	17	18	Planned/ Actual Completion	Status	POC
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Weather:Environmental Information	Archive interplanetary data simulation runs for the Enlil operational space weather model per NWS request								X									31-Mar-11	C	W. Denig
Coastal:Marine Transportation	Achieve Initial Operating Capability (IOC) for disseminating in real-time satellite data received via McMurdo Station in compliance with the Antarctic Treaty									X								30-Jun-12	C	S. Anderson
Weather:Environmental Information	Develop in-house capability to process NOAA POES Space Enviroment Monitor (SEM) data for satellite operations										X							30-Sep-12	Y	J. Green
Wea																				dis
Wea Information	(SEM) satellite data archived on an annual basis					>95	100%	95	95	95	95	95	95	95	95	95	95	3QFY12 4QFY12	100% '	D. Wilkinson
Coastal:Marine Transportation	Acquire, process, and disseminate >95% of available real-time nighttime lights imagery within 3 hours of receipt					>95	100%	95	95	95	95	95	95	95	95	95	95	1QFY12 2QFY12 3QFY12 4QFY12	100% 100% 100% '	C. Elvidge
Weather:Environmental Information	Provide a >95% availability for Continuously Operating Reference Station (CORS) near real-time data to to the NWS Space Weather Prediction Center					>95	100%	95	95	95	95	95	95	95	95	95	95	1QFY12 2QFY12 3QFY12 4QFY12	100% 100% 100% '	F. Coloma
																			As of 01 Jul 2012	

3QFY12 Milestone: Achieve Initial Operating Capability (IOC) for disseminating in real-time satellite data received via McMurdo Station in compliance with the Antarctic Treaty

Milestones & Performance Measures

3QFY12 AOP Milestone – DMSP/McMurdo

Milestone: Achieve Initial Operating Capability (IOC) for disseminating in real-time satellite data received via McMurdo Station in compliance with the Antarctic Treaty.

Planned Completion: 3QFY12 (30 Jun 12)
Actual Completion: 3QFY12 (24 Mar 12)

Status: Complete – Residual Ops

DIRECTOR
DEFENSE WEATHER SYSTEMS DIRECTORATE
HEADQUARTERS SPACE AND MISSILE SYSTEMS CENTER (AFSPC)

Dr. Sharolyn Anderson
NOAA/NGDC

Dear Dr. Anderson,

I would like to sincerely thank you for your support of the DMSP at McMurdo Project. Your hard work and dedication directly contributed to the success of this Project achieving Initial Operational Capability.

Your participation helped bring new capabilities to the warfighter. First, McMurdo will incrementally reduce DMSP stored mission data (SMD) latency from two primary spacecraft to 55 minutes compared to the current 112 minutes for SMD, improving cloud analysis accuracy by about 10% per day. Second, there will be a dramatic increase in DMSP fine resolution OLS cloud imagery data from 35% /rev up to ~100% /rev global coverage, relieving more space on the DMSP recorders to "record" more fine data, reducing the age of data available for the model assimilation cycle.

Thanks to your help, DMSP can get more imagery to the warfighter faster. The DMSP at McMurdo Project is a great accomplishment and a significant milestone in DMSP's 50 year history!

The DMSP at McMurdo Project would not have been a success without your critical role. Again, thank you.

Sincerely

SCOTT C. LARRIMORE
Colonel, USAF

Milestones & Performance Measures
4QFY12 AOP Milestone – POES Processing

Watch Item: POES Processing – Space Environment Monitor (SEM)

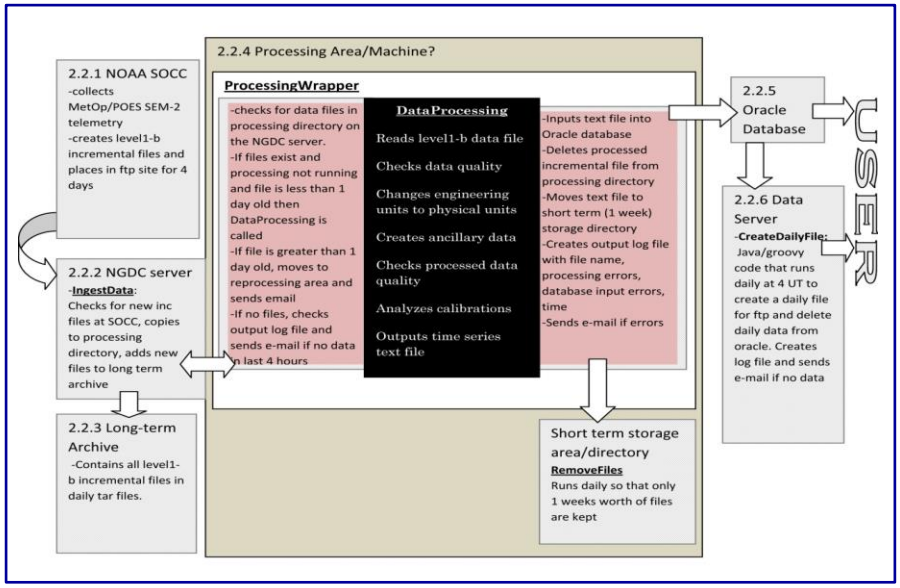
4QFY12 Milestone: Develop in-house capability to process NOAA POES Space Environment Monitor (SEM) data for satellite operations.

Issue: Developing the middleware is taking longer than expected. Some algorithms leveraged by the development team have been found to be faulty/problematic.

Residual Impacts: The processing code is expected to be in place to support the MetOp-B SEM data processing. MetOp-B launch date is 19 Sep 12. Code development is funded through the Satellite Products and Services Review Board.

Way Ahead: Continued development will be closely monitored to ensure that a minimal processing capability exists to support the MetOp post-launch processing. Development of a more robust architecture is a task included in the Epic List for the NGDC Agile Team.

Long-term Impacts: None. The SEM unprocessed data products are currently being archived and will be available for post-event processing.



Milestones & Performance Measures

FY12 Performance Measures

STP Annual Performance Measures								
Space Weather Metric								
LO	Goal	Objective	Performance Measure	POC	1QFY12	2QFY12	3QFY12	4QFY12
NWS	Weather-Ready Nation (NWS)	A More Productive and Eficient Economy Through Environmental Information Relevant to Key Sectors of the U.S. Economy	Greater than 95% (2 sigma) of available Space Environment Monitor satellite data are archived on an annual basis	Wilkinson	100%	100%	100%	
Nightime Lights Metric								
LO	Goal	Objective	Performance Measure	POC	1QFY12	2QFY12	3QFY12	4QFY11
CS	Climate Adaptation and Mitigation (CS)	Improved Scientific Understanding of the Changing Climate System and Its Impacts	Acquire, process and disseminate >2 sigma (95%) of available real-time nighttime lights imagery within 3 hours of receipt	Elvidge	100%	100%	100%	
CORS								
LO	Goal	Objective	Performance Measure	POC	1QFY12	2QFY12	3QFY12	4QFY11
NOS	Resilient Coastal Communities and Economics (NOS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Provide a >2 sigma (95%) availability for Continuously Operating Reference Station (CORS) near-real-time data to the NWS Space Weather Prediction Center as per the '4-way' Memorandum of Agreement and subject to normal business-hour response times.	Coloma	100%	100%	99.8%	
								As of 07 Jul 12

Greater than 99% (3-sigma) Cumulative Distribution

Greater than 97% (2-sigma) Cumulative Distribution

Greater than 84% (1-sigma) Cumulative Distribution

Below 84.1% (1-sigma) Cumulative Distribution

Note: COR-West had an unplanned 3.5 hours downtime on 02 May.

Note: Change metric wording in FY13 for a cumulative distribution.

OUTLINE
Solar & Terrestrial Physics Division

STP Division Overview

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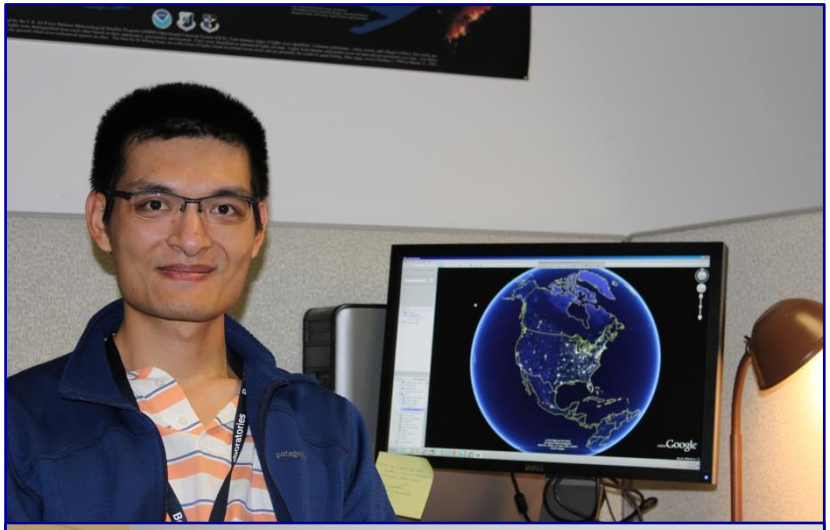
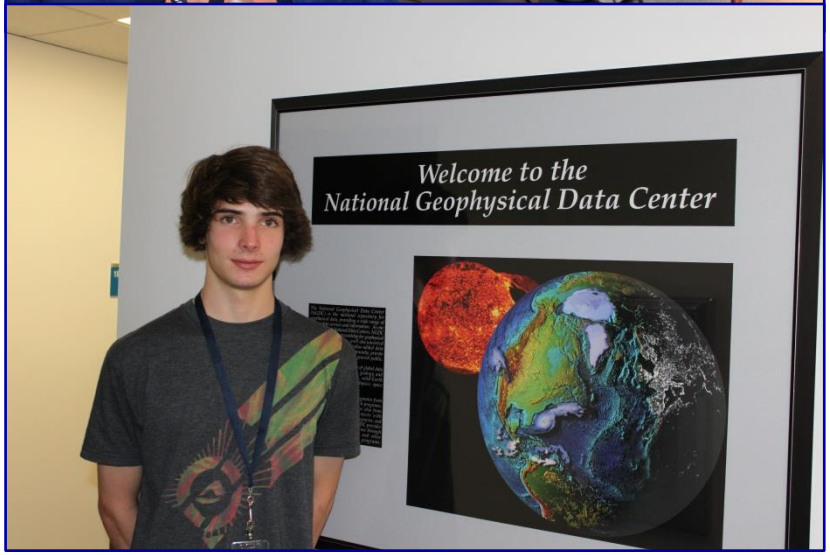
Personnel Activities
Hail and Farewell

Welcome Holling Scholars

- Jenny Mills, Northwestern
- Ranjeetha Bharath, MIT

Welcome Dr David Tsu & Stefan Codrescu





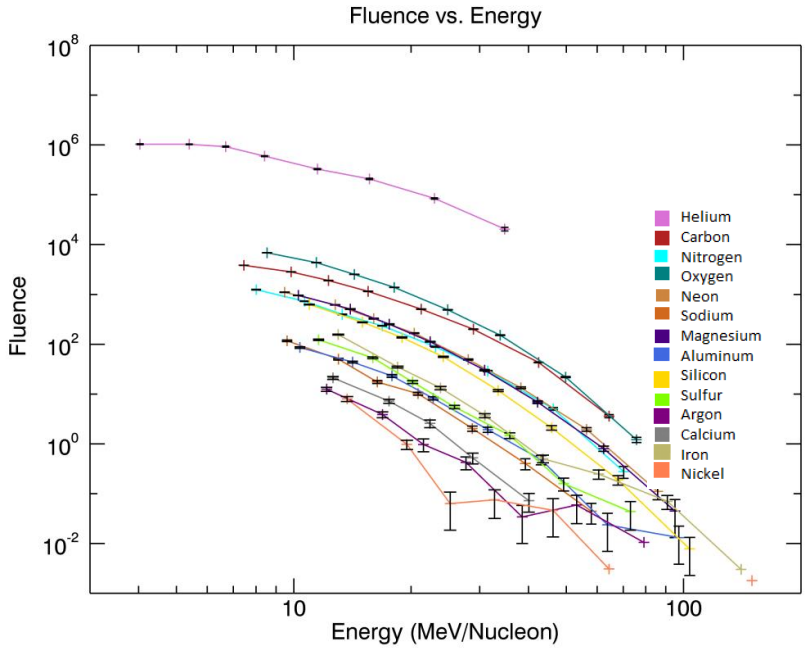
Personnel Activities
Solar Energetic Particle (SEP) Events

Purpose : Characterize the heavy ion spectral abundances in SEP events in support of GOES-R L2+ product development for the Energetic Heavy Ion Sensor (EHIS)

Approach: Create a proxy dataset of heavy ion fluxes in SEP events using data from the ACE Solar Isotope Spectrometer having an overlapping energy range with the GOES-R EHIS

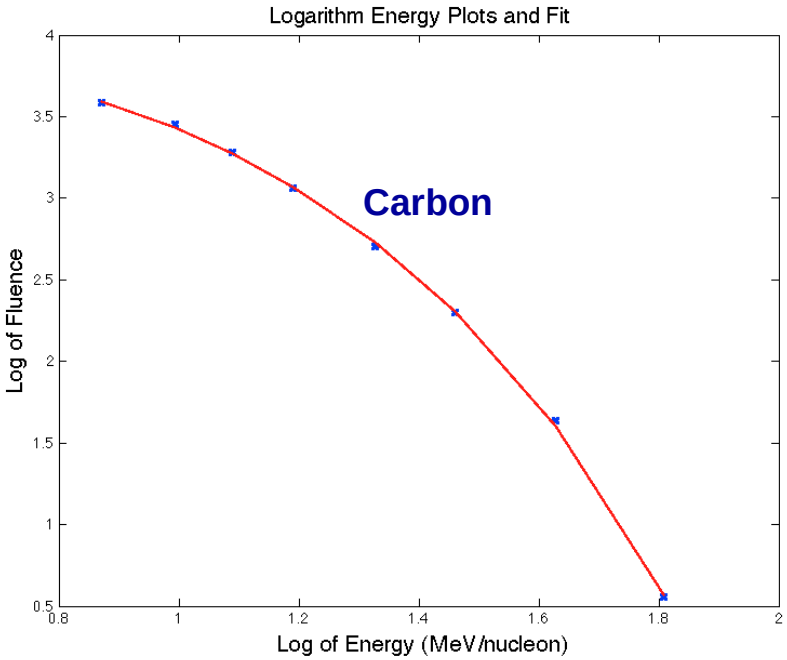
Hollings Scholar: Ranjeetha Bharath

Mentor: Dr. Juan Rodriguez



Fluence Spectra

Data from the 17-19 Jan 2005 SEP Event - Displayed for 14 Elements (Helium through Nickel)



Curve-fit to Spectrum of Carbon

Uses a physics-based three-parameter expression from Mazur et al. (*Ap.J., 401*, 398-410, 1992) which involves a Modified Bessel Function of the Second Kind

Personnel Activities
Solar Energetic Particle (SEP) Events

Purpose : Create a >10-year database of quality-controlled auroral boundaries for the GEM and CEDAR modeling communities

Approach: Use energetic particle data from DMSP to identify auroral zone on either side of the polar cap and transform the auroral boundaries into normalized coordinates

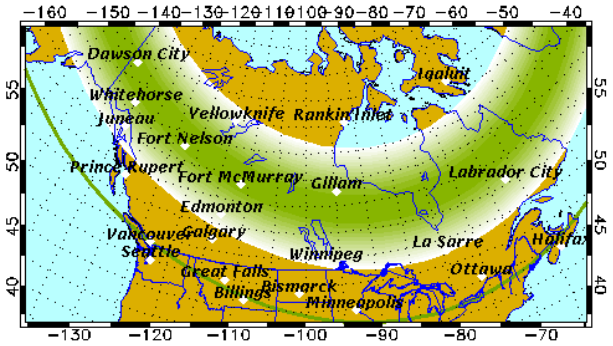
Hollings Scholar: Jenny Mills

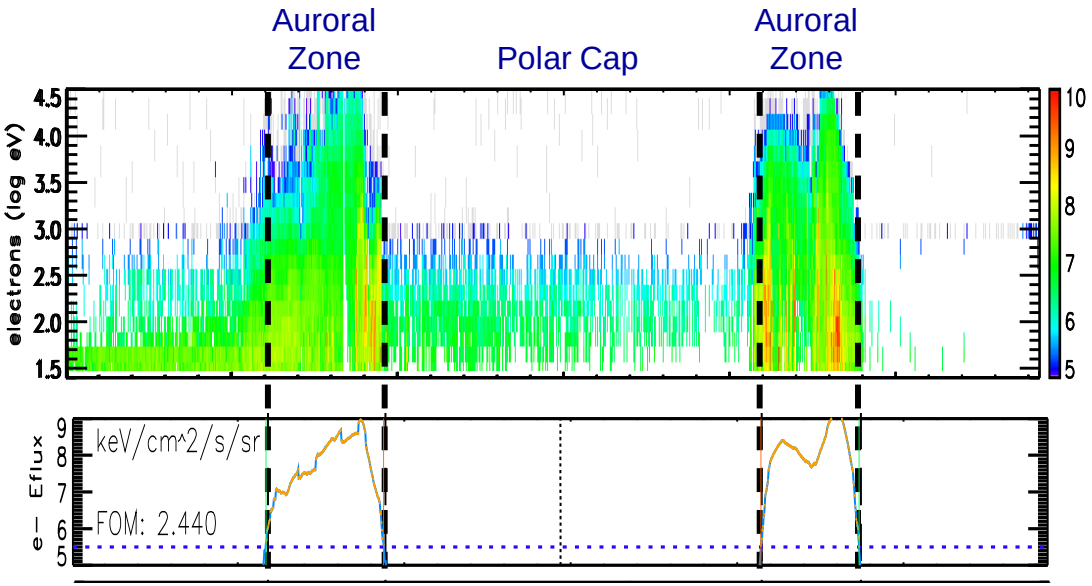
Mentor: Dr. Rob Redmon

Use Figure of Merit (FOM) to:

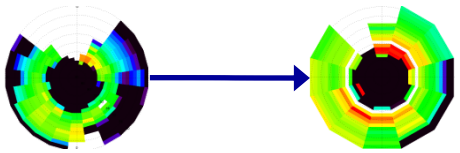
- ✓ Discern/discount transient and spatially-limited arcs
- ✓ Filter satellite orbits for high-quality auroral boundaries

$$FOM_{i,j} = \frac{A_i}{A_{\max}} + \frac{A_j}{A_{\max}} + \frac{DT_{i,j}}{20}$$



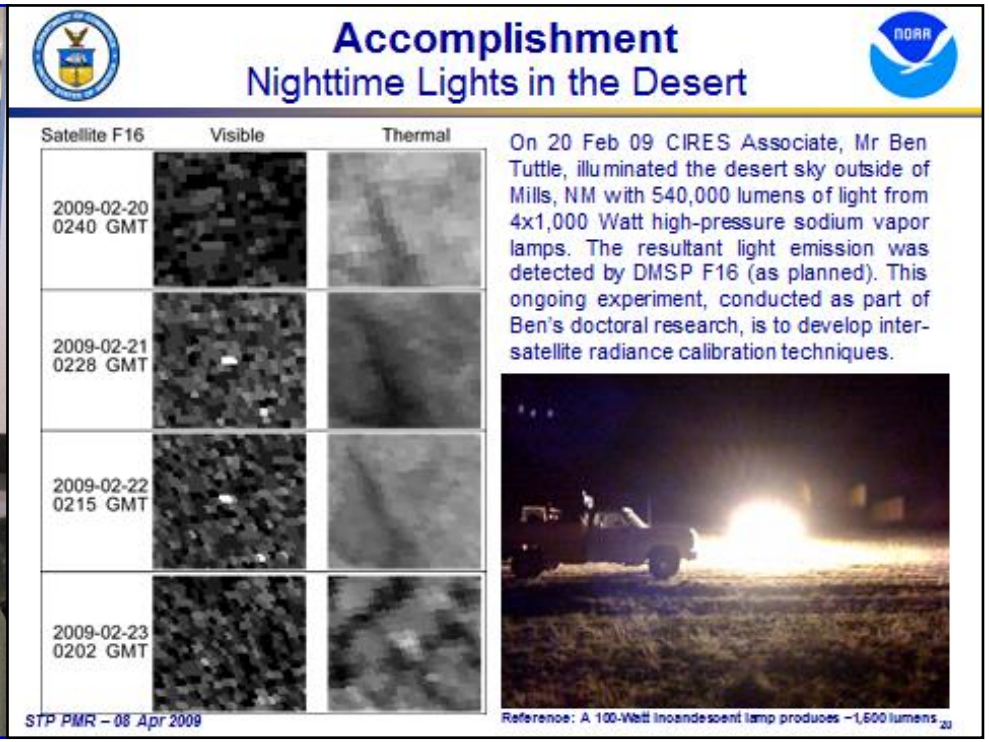


Convert to boundary-normalized coordinates according to the methodology of Redmon et al. (2010; 2012)



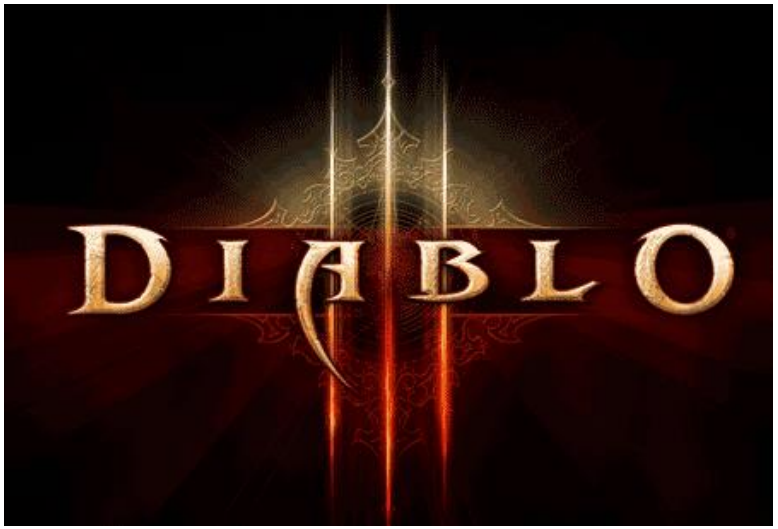
Personnel Activities
Congratulations “Dr” Ben Tuttle

Ben Tuttle has successfully defended his doctoral thesis, “Aladdin’s Magic Lamp: Developing Methods for Calibration and Geolocation Accuracy Assessment of the DMSP OLS”. Ben’s degree will be from the Department of Geography at the University of Denver. Ben was a long time CIRES Associate in the Earth Observations Group (EOG) from Summer 1998 to June, 2010. Dr. Tuttle currently works for the National Geospatial Intelligence Agency (NGA)



Personnel Activities
Farewell Peter Elespuru

Hand in the “Cookie Jar”



Peter’s New Office Mates

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Solar & Terrestrial Physics Division

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Accomplishments & Updates

SEGA Report Delivered to Congress

REPORT

ON

SPACE WEATHER OBSERVING SYSTEMS:

CURRENT CAPABILITIES AND

REQUIREMENTS FOR THE NEXT DECADE

Co Chairs:
Dr W. Denig, NOAA National Geophysical Data Center
Col J. Egentowich, HQ USAF, Air Force Weather

April 13, 2012

Prepared by the

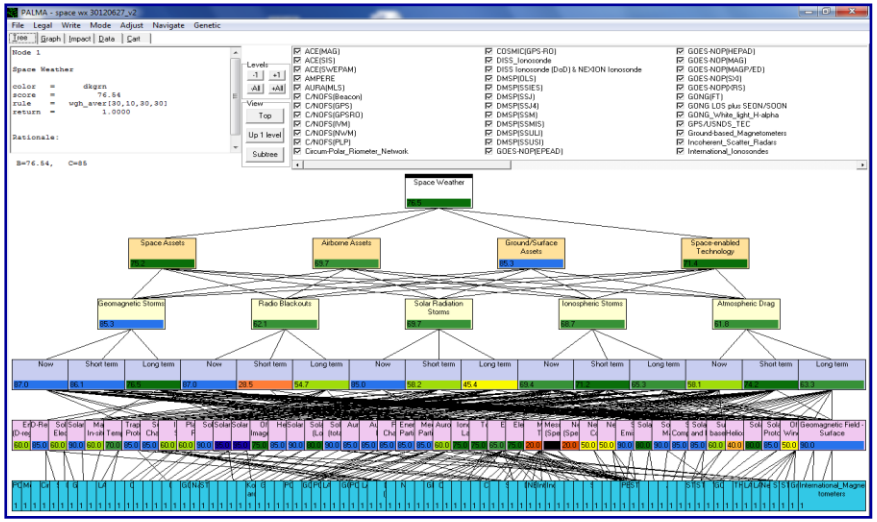
Office of the Federal Coordinator for Meteorological Services and Supporting Research

National Space Weather Program Council

Joint Action Group for Space Environmental Gap Analysis

In response to a request by the
Office of Science and Technology Policy
in the
Executive Office of the President

Space Environment Gap Analysis (SEGA) report was (finally!) delivered to Congress in April 2012. SEGA report is also being used by the **National Earth Observation (NEO) Task Force** (co-chair Dr. Sullivan) to develop a National strategy for Earth observations. Space weather is 1 of 12 "societal benefit areas" under consideration by the NEO Assessment WG (co-chair Pam Taylor). Mike Bonadonna is the space weather lead. SWPC's well engaged in the process. WFD is contributing at arm's length to this project.



Accomplishments & Updates
Prioritization of GOES-R L2+ Algorithms

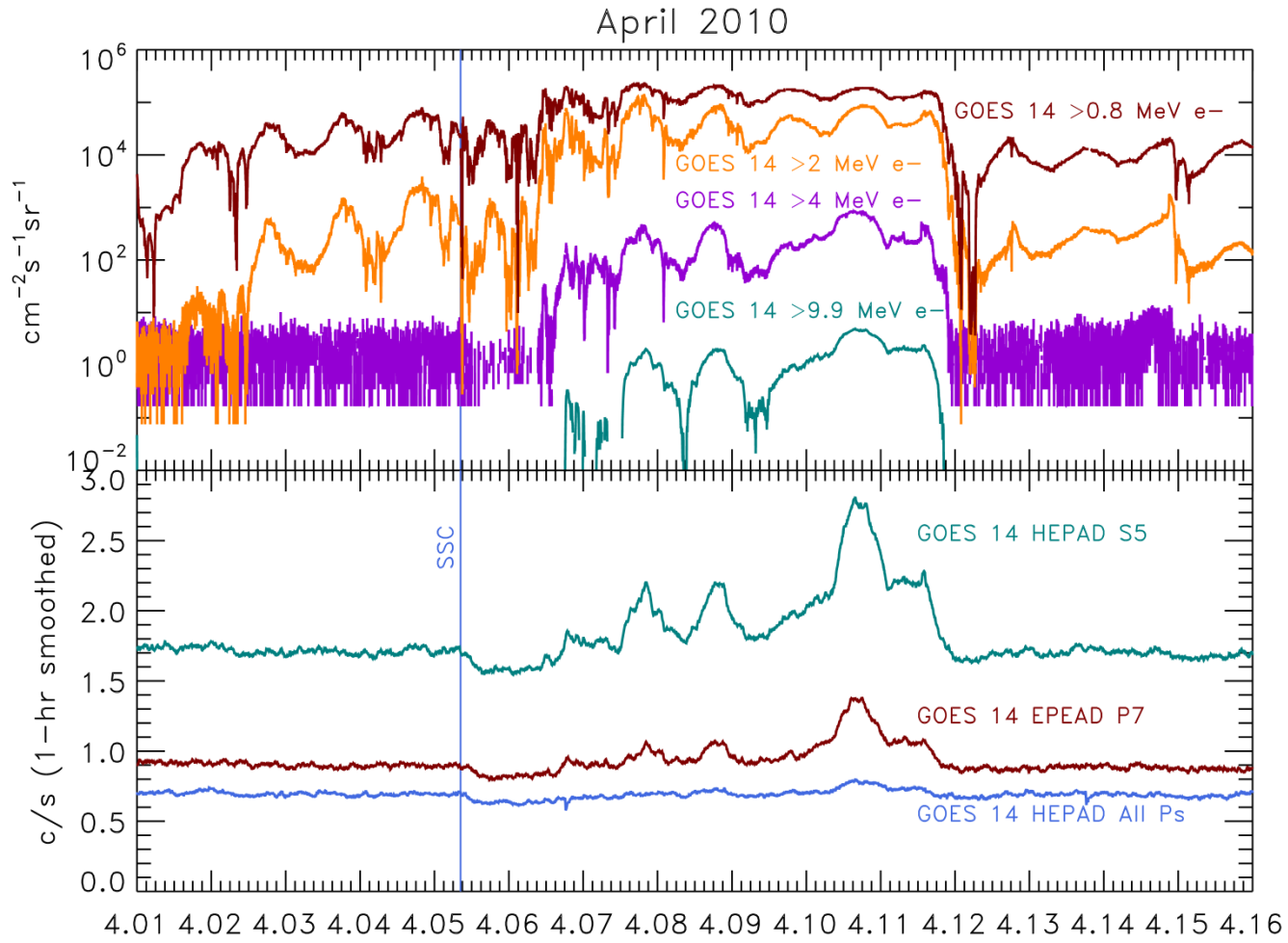
NWS/SWPC has prioritized the L2+ algorithms currently under development (**NGDC**). HQ NWS requested additional cost information for NGDC proposal to produce L2+ products for SWPC.

Critical	Supplemental +	Supplemental -
EUVS 1-minute Averages	EUVS Daily Averages	EUVS Event Detection
XRS 1-minute Averages	EUVS Multi-wavelength Proxy	MAG Magnetopause Crossing Detection
XRS Ratios	XRS Daily Background	SUVI Coronal Hole Images
XRS Event Detection	MAG Alternate Coordinate Systems	SUVI EUV Narrow Band Irradiance
XRS Flare Location	MAG 1-minute Averages	
MAG Sudden Impulse Detection	MAG Comparison to Quiet Fields	
SEISS 1-minute Averages	SEISS Moments	
SEISS 5-minute Averages	SUVI Fixed Differences	
SEISS Diff to Integral Flux	SUVI Running Differences	
SEISS Event Detection	SUVI Thematic Maps	
SUVI Composite Images	SUVI Coronal Hole Boundaries	
SUVI Flare Location Reports		Red = under development

Accomplishments & Updates

Potential New GOES Data Product

Observations of relativistic electrons of energy >9.9 MeV



Collaborative work with The Aerospace Corp

Accomplishments & Updates
Stakeholders Meeting – Spacecraft

Findings - Greatest Needs of the Community

- Assessment of fleet vulnerability to large events and plan for dealing with the subsequent impacts – requires a research investment; funding possibilities include NASA TR&T, NOAA, USAF, NRO
- Meaningful *actionable* alerts (SWPC, NGDC)
- Anomaly database tied to products:
  - Input anomaly to provide environmental data plots for identifying root cause
  - Historical anomalies viewed on interactive map; i.e., natural hazards viewer
- Education – partnership with commercial vendors that can provide companies with more tailored information

Community Representatives

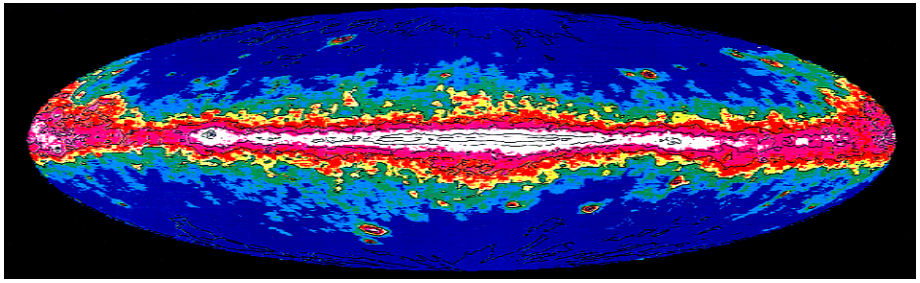
Accomplishments & Updates

VIIRS Anomalies – Environmental Impact

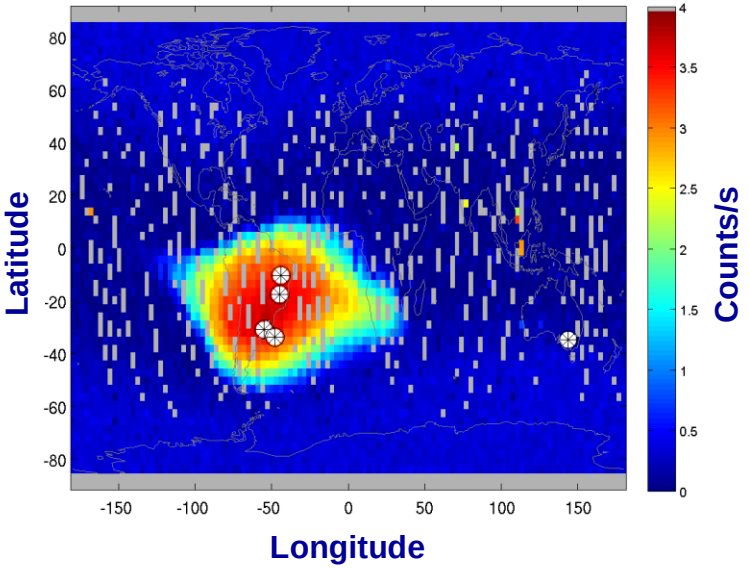
The VIIRS on NPP has suffered 5 anomalies since launch in Oct 2011

BLUF

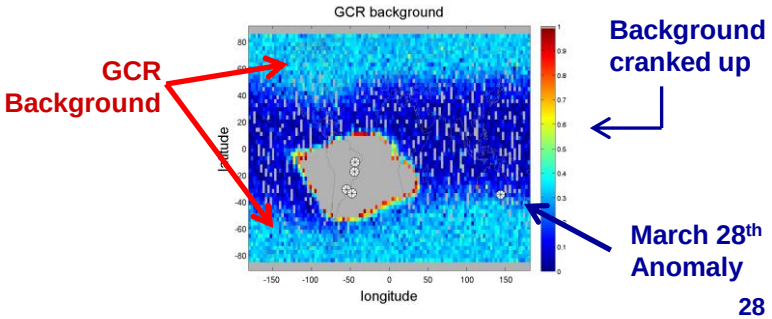
- Based on measurements of the particle radiation environment from the POES/MetOp satellites at the time of the anomalies, the VIIRS anomalies are most likely single event upsets (SEUs) caused by energetic protons and Galactic Cosmic Rays (GCR).
- Given the stable nature of the energetic protons in the South Atlantic Anomaly and the GCR's over the polar regions there will likely continue to be similar anomalies in these regions.
- Analysis by Janet Green forwarded to the JPSS Program Office (Mitch Goldberg)



>35 MeV Proton Flux

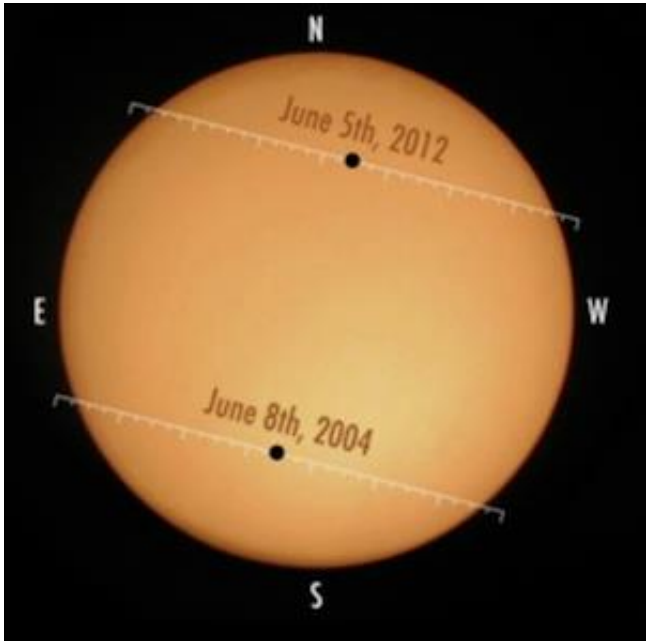


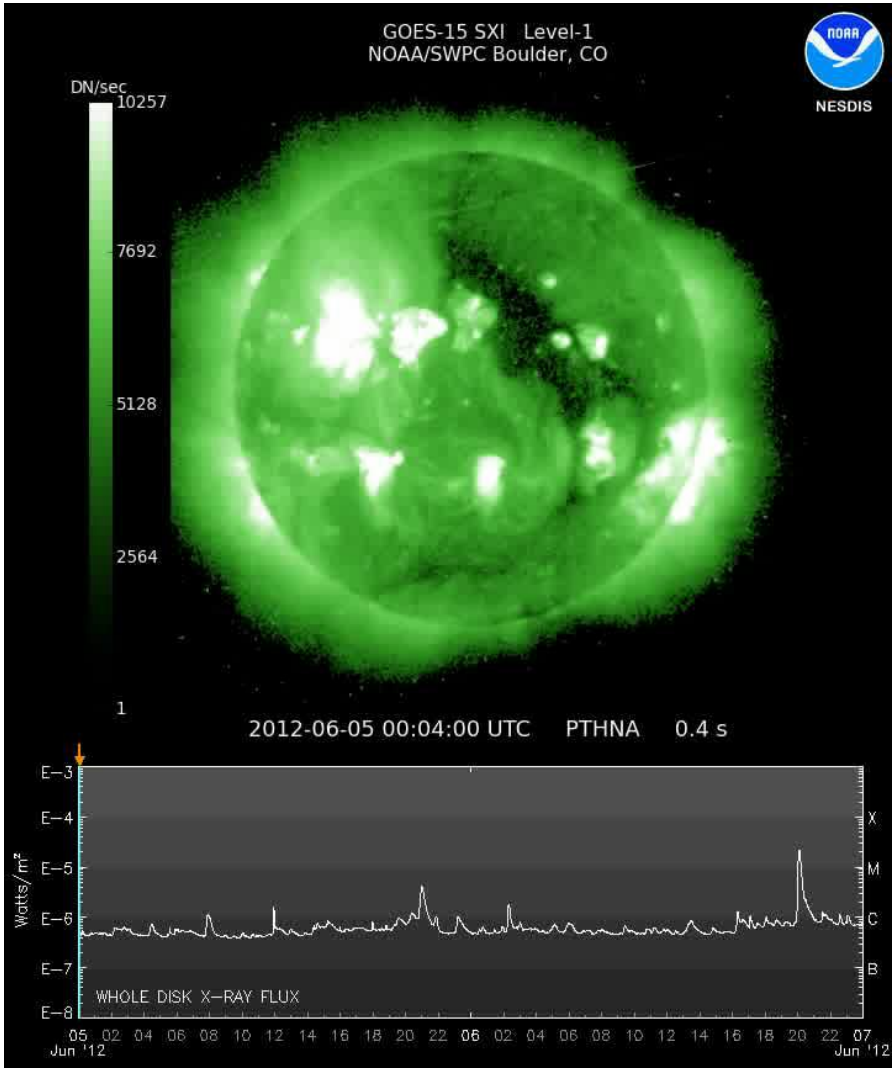
Event locations (white circles) with the flux of >35 MeV protons compiled from all POES satellites (Data from 28 March 2012).



Accomplishments & Updates
SXI – Venus Flyby

On 05-Jun the planet Venus made a rare fly-by of the sun that was observed by the GOES-15 SXI. The next opportunity to view a flyby will occur in 105 years. Venus flybys come in pairs with the recent flyby completing the 2004-2012 pair.



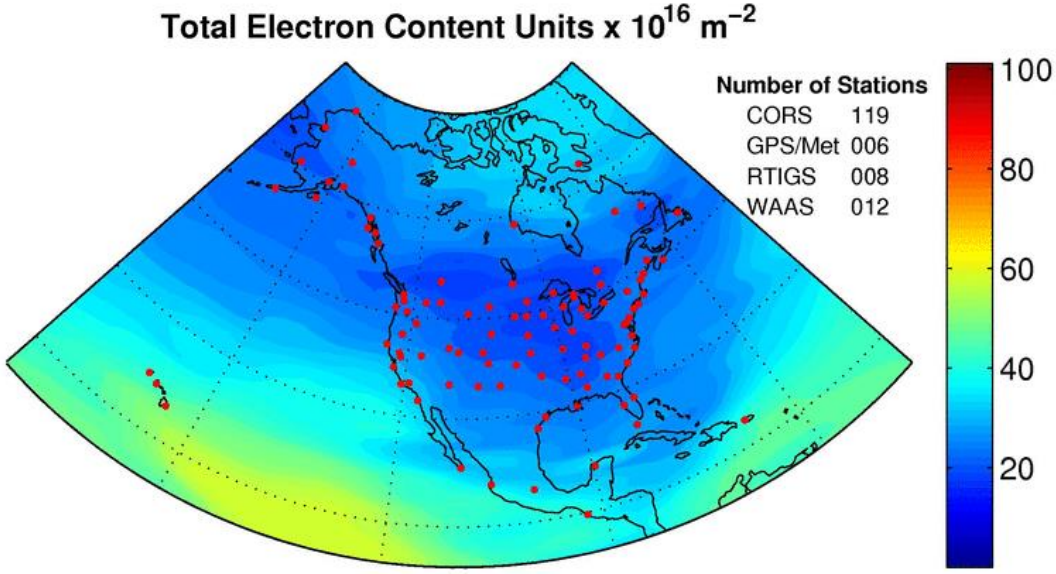


Click image to start movie

Accomplishments & Updates

US-TEC Goes Continental

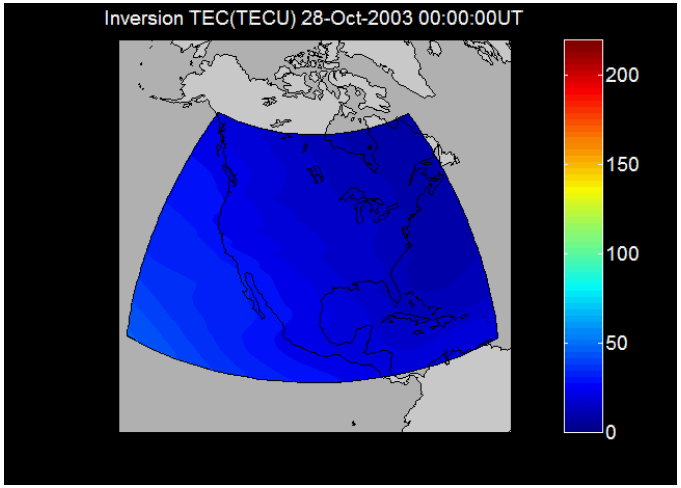
Dominic Fuller-Rowell has assisted SWPC on the development of the North American Total Electron Content (NA-TEC) model. CORS contributes, by far, the greatest number of GPS receiver sites used for NA-TEC. The image below shows an apparent relaxation to ionospheric climatology in unconstrained areas of limited GPS sites.



Accomplishments & Updates
US-TEC Downloads

PMEL launches "denial of service" attack against NGDC!!

A PMEL web crawler apparently went awry and may have been responsible as many as 8 million hits to the US-TEC THREDDS server. Rich Fozzard has now resolved the issue with PMEL.



Click image to start movie

Per Rich Fozzard

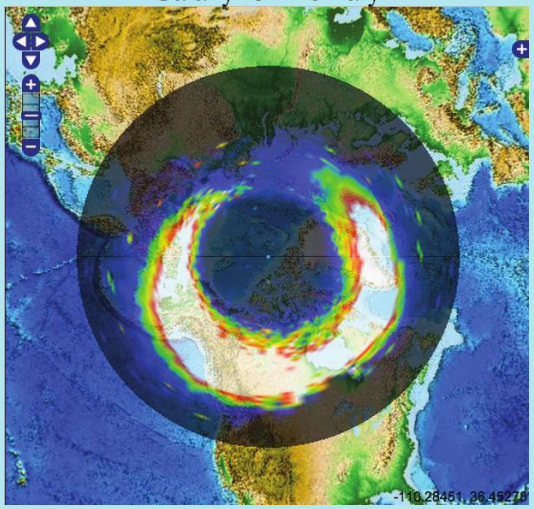
- Terabyte winners (directories and files): THREDDS was the big winner this month with over 8 million hits to USTEC -- over a third of all hits to NGDC! Metadata and Ionosonde return to the top ten this month.

#:	#reqs:	%reqs:	Tbytes:	%bytes:	directory
:	8026202:	33.59%:	0.01:	0.55%:	/thredds/dodsC/ustec/
:	3607664:	15.10%:	0.06:	2.11%:	/rest/services/web_mercator/
3:	3102640:	12.98%:	1.20:	44.80%:	/mgg/
:	1552602:	6.50%:	0.52:	19.41%:	/mgg/global/
:	1541002:	6.45%:	0.52:	19.40%:	/mgg/global/relief/
:	707235:	2.96%:	0.24:	9.13%:	/mgg/image/
:	1228702:	5.14%:	0.01:	0.46%:	/ionosonde/data/
5:	960109:	4.02%:	0.02:	0.65%:	/metadata/
:	959182:	4.01%:	0.02:	0.64%:	/metadata/published/
:	680883:	2.85%:	0.01:	0.24%:	/metadata/published/xsd/
:	259104:	1.08%:	0.01:	0.36%:	/metadata/published/NOAA/
:	655458:	2.74%:	0.09:	3.33%:	/stp/ovation_prime/data/
7:	537322:	2.25%:	0.05:	1.82%:	/geomag/
:	304281:	1.27%:	0.01:	0.50%:	/geomag/data/kml/
8:	531633:	2.22%:	0.07:	2.61%:	/hazard/
:	223374:	0.93%:	0.00:	0.08%:	/hazard/stratoguide/
9:	498382:	2.09%:	0.10:	3.79%:	/eog/
:	498057:	2.08%:	0.10:	3.79%:	/eog/nrt/
:	332604:	1.39%:	0.00:	0.03%:	/eog/nrt/incoming/
10:	484463:	2.03%:	0.00:	0.16%:	/geomag-web/
:	380891:	1.59%:	0.00:	0.06%:	/geomag-web/calculators/

Accomplishments & Updates
Aurora on Twitter – Stefan Codrescu

From the Chapman Conference on Auroral Processes

OVATION Forecast During the Galaxy 15 Anomaly



From the Auroral Resources Toolkit (ART)
http://spidr.ngdc.noaa.gov/art

CROWD-SOURCED AND MODELED AURORA

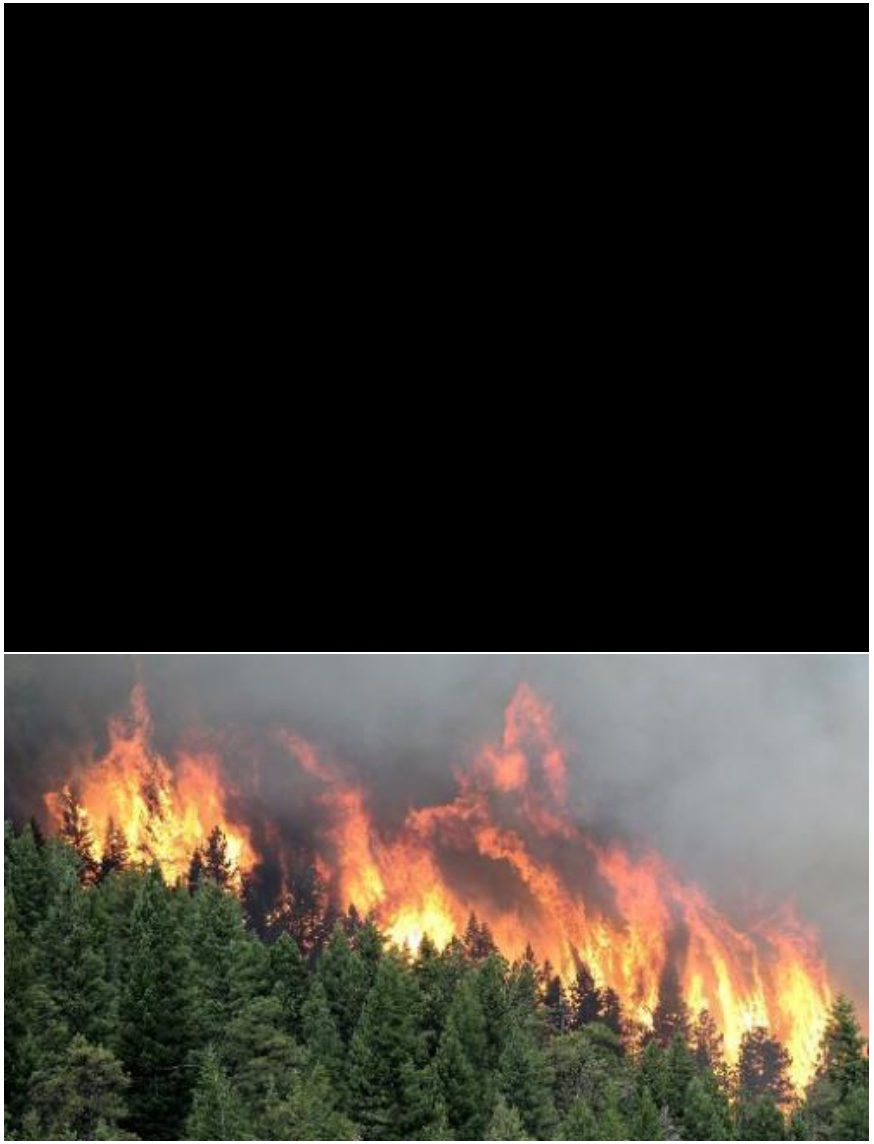
The aurora offers an invaluable opportunity for scientists to directly engage the general public's fascination. NGDC is creating a new auroral product that merges crowd-sourced auroral sightings with OVATION Prime predictions and satellite observations. We are using Google Earth, the Keyhole Markup Language (KML), Twitter with domain specific hash tags, the Auroral Resources Toolkit (ART), moderated Flickr and other auroral photo and video streams.

OVATION Prime, developed by JHU/APL, is based on DMSP electron and ion precipitation measurements. The model predicts four auroral types: diffuse ions and electrons, discrete monoenergetic and wave/broadband electrons. The real-time implementation at NGDC (at left) forecasts auroral energy deposition using L1 measurements of the solar wind.

http://www.ngdc.noaa.gov/stp/ovation_prime/

Program is in early planning phase to assess community interest

Accomplishments & Updates
Flagstaff Wildfire – NGS Impacts



CORS-West Handover to Silver Spring

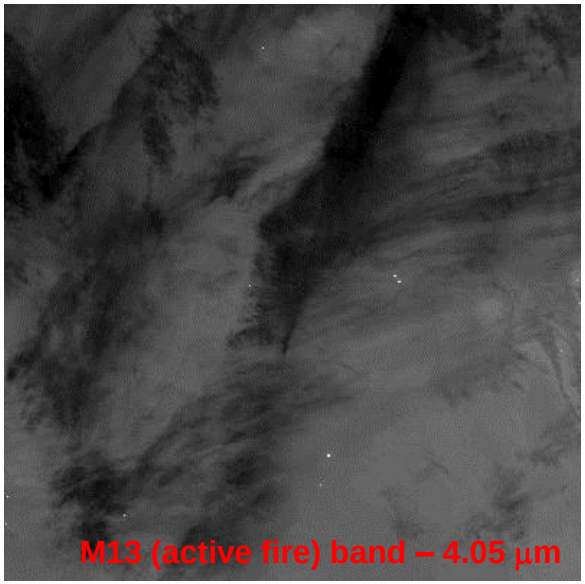
- On 26 June (Tuesday) at 14:51 MT a lightning-induced wildfire was reported in the Flagstaff Mountain area, approximately 3 miles from the NOAA DSRC building.
- On the evening of 26 June, NGS deputy director Ronnie Taylor activated the emergency phone tree for NGS staff, including Fran Coloma for CORS.
- On 27 June (Wednesday), NGS initiated COOP procedures and switched all CORS collection to Silver Spring, MD.
- Handover back to shared responsibilities with Boulder occurred on the following day, 28 June (Thursday).
- Collection, distribution and archive of CORS data continued unabated by the incident.

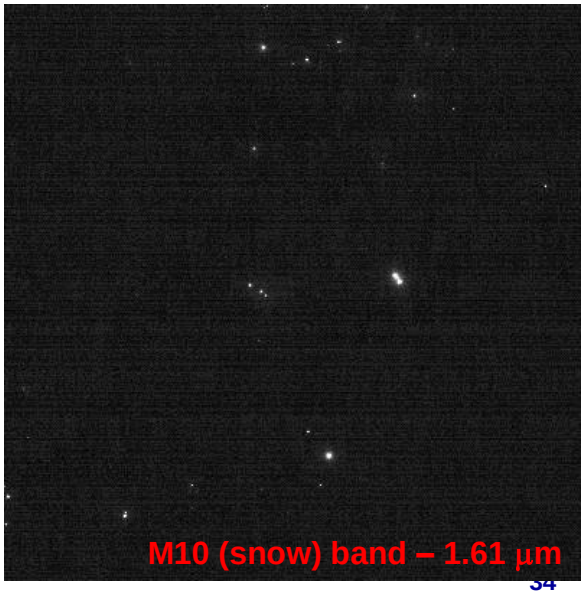
Accomplishments & Updates

VIIRS: M10 Band vs M13 Band

The VIIRS M13 band (4.05 microns) is the designated active fire detection band. However, gas flares show up better in the M10 band @ 1.61 microns than in the M13 due to the higher temperature in gas flaring than in biomass burning.

M10 band (snow faction)

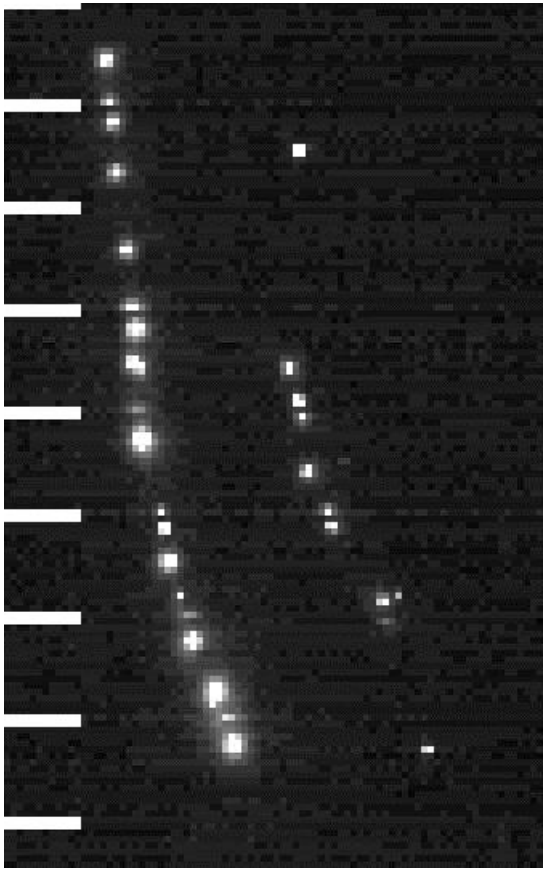




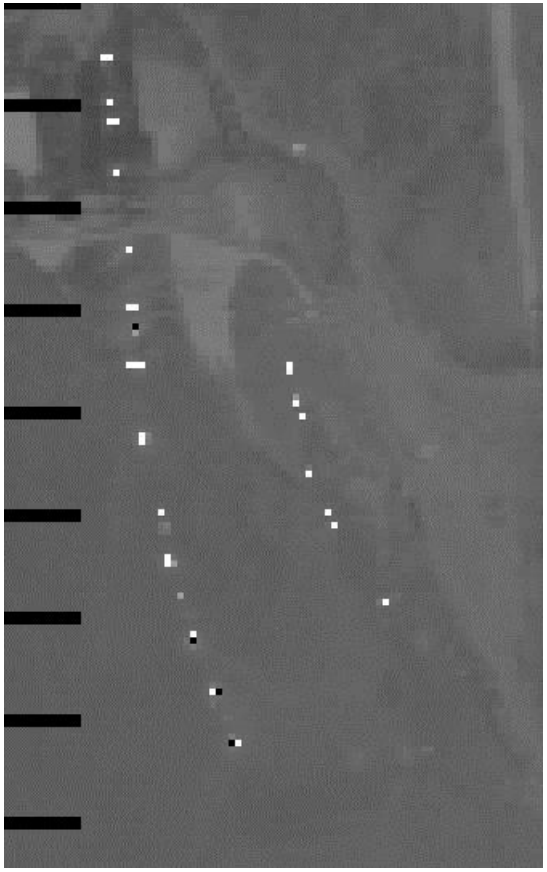
Accomplishments & Updates

VIIRS Cloud Mask Issues

VIIRS Cloud Algorithm Mistakenly Identifies Gas Flares as Clouds



M10 band
1.61 microns

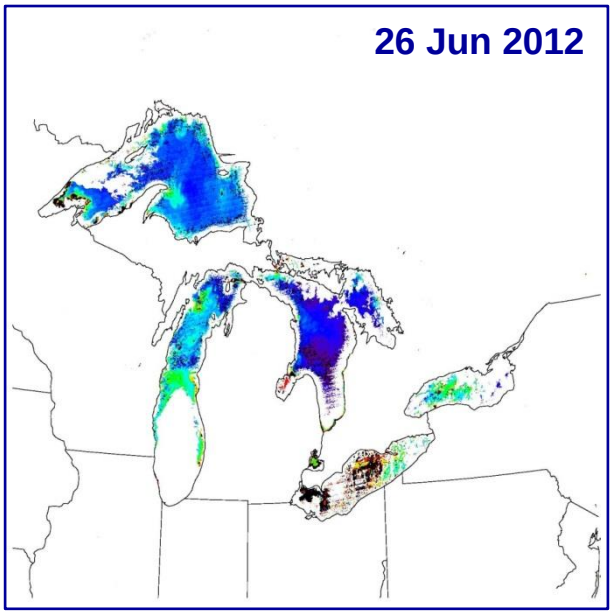


M13 band
4.05 microns

VIIRS
Cloud mask

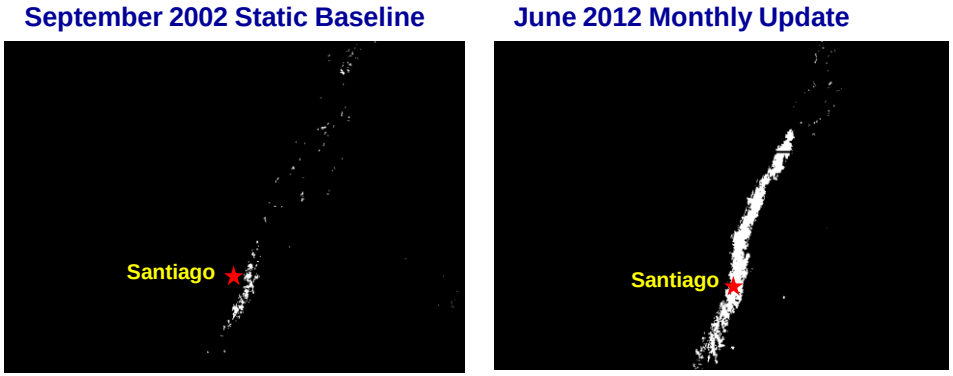
Gas Flaring detected in Basra, Iraq

Accomplishments & Updates
. . . and more on VIIRS



The above VIIRS chlorophyll image for the Great Lakes region is not a standard JPSS operational product – current product limited to ocean areas only. The above image, produced on-line using the Algorithm Development Library (ADL) shows the value of having a quasi-operational capability for product development.

Input provided by Pat Purcell/CIRA



(Imagery provided by Robert Mahoney, NGAS)

Shown above (left) is the current binary snow-ice mask (GridIP-VIIRS-Snow-Ice-Cover-Rolling-Tile IP) used by the VIIRS Cloud Mask (VCM) and OMPS Total Ozone algorithms. The current snow-ice mask is derived from a September 2002 static table which is woefully out of date. There is a need for an alternative source of information if a location mask has not been updated from the Snow Cover Binary Map EDR for longer than some [*TBD*] threshold (right image). *Something for NSIDC to consider?*

Input provided by Paul Meade/CPI @ NGDC

OUTLINE
Solar & Terrestrial Physics Division

STP Division Overview

Milestones & Performance Measures

Personnel Activities

Accomplishments & Updates

Issues & Summary

Issues & Summary
STP FY12 Publications (YTD) – 13

Publications (YTD):

Allen, J. H., **C. A. Clark**, **W. F. Denig** and **D. C. Wilkinson** (2012), Historical Upper Atmosphere Geophysics Reports Now Available Online, Space Weather, 10, S05007, doi:10.1029/2012SW000802.

Alvarez, R., II, C. Senff, A. Langford, A. Weickmann, D. Law, **J. Machol**, D. Merritt, R. Marchbanks, S. Sandberg, W. Brewer, R. Hardesty, and R. Banta (2011), "Development and application of a compact, tunable, solid-state airborne ozone lidar system for boundary layer profiling", J. Oceanic Atmos. Tech., 28, 1258-1272, doi: 10.1175/JTECH-D-10-05044.1.

Araujo-Pradere, E.A., D. Buresova, **D.J. Fuller-Rowell**, and T.J. Fuller-Rowell (2012), Initial results of the evaluation of IRI hmF2 performance for minima 22-23 and 23-24, *Adv. Space Res., in press.*

Chaturvedi M., **T. Ghosh**, and L. Bhandari. (2011). Assessing income distribution at the district level for India using nighttime satellite imagery. *Proceedings of the 32nd Asia-Pacific Advanced Network Meeting*. New Delhi, India.

Elvidge, C.E., P.C. Sutton, **K.E. Baugh**, **S. Anderson**, **T. Ghosh** and **D. Ziskin** (2011) Satellite observation of urban metabolism in China, Proceedings of the Asian Conference on Remote Sensing, Taipei, Taiwan, October 3, 2011.

Elvidge, C.D., **K.E. Baugh**, **P.C. Sutton**, B. Bhaduri, B.T. Tuttle, **T. Ghosh**, **D. Ziskin** and **E.H. Erwin** (2011), "Who's In The Dark: Satellite Based Estimates Of Electrification Rates", *Urban Remote Sensing: Monitoring, Synthesis and Modeling in the Urban Environment*, Ed. X. Yang, Wiley-Blackwell, Chichester, UK, p. 211-224.

Kristina H.Y., **S.J. Anderson**, R.L. Powell, D.G. Sullivan and P.C. Sutton (2011), Identifying Similar Biophysical Characteristics among Nesting Beaches of Green Turtles of Turkey Using Remote Sensing Techniques, International Journal of Remote Sensing Applications (IJRSA), pp. 22-29, 31-Dec-2011.

Machol, J.L., **J.C. Green**, **R.J. Redmon**, R.A. Viereck and P.T. Newell (2012), Evaluation of OVATION Prime as a Forecast Model for Visible Aurorae, *Space Weather, 10*, S03005, doi:10.1029/2011SW000746.

Redmon, R.J., Upwelling to Outflowing Oxygen Ions at Auroral Latitudes during Quiet Times: Exploiting a New Satellite Database, PhD Thesis, University of Colorado, Boulder, 2012.

Redmon, R.J., W.K. Peterson, L. Andersson and **W.F. Denig** (2012)**,** A global comparison of O^+ upward flows at 850 km and outflow rates at 6000 km during nonstorm times, *J. Geophys. Res.*, 117, A04213, doi:10.1029/2011JA017390.

Rodriguez, J.V. (2012), Undulations in MeV solar energetic particle fluxes in Earth's magnetosphere associated with substorm magnetic field reconfigurations, *J. Geophys. Res.*, 117, A06229, doi:10.1029/2012JA017618.

Small, C., **C.D. Elvidge**, D. Balk and M. Montgomery (2011), "Spatial scaling of stable night lights", *Remote Sensing of Environment*, Elsevier, 115 (2011), 269-280.

Zhao, N., **T. Ghosh**, N. A. Currit and **C.D. Elvidge** (2011). Relationships between satellite observed lit area and water footprints, *Water Resource Management*, *25*, 2241-2250.

ftp://ftp.ngdc.noaa.gov/STP/publications/stp_publications/stp_publications.pdf

Issues & Summary

STP FY12 Presentations (YTD) – 46 (1 of 4)

Presentations (YTD):

32nd Asian Conference on Remote Sensing (ACRS), 03-07 Oct 2011, Taipei, Taiwan

– Satellite observation of urban metabolism in China (Oral), **C.D. Elvidge**, P.C. Sutton, **K.E. Baugh**, **S. Anderson**, **T. Ghosh**, and **D. Ziskin**

US-UK Space Weather Workshop, 11-13 October 2011, Boulder, CO

– What are the requirements from satellite customers (Oral), **J.C. Green**

7th GOES Users' Conference, 15-21 October 2011, Birmingham, AL

– GOES Data and Products in the Space Weather Forecast Office (Oral), M. Shouldis, R. Viereck, S. Hill, J. Rigler, J.V. Rodriguez, and P. Lotoaniu

5th International Association for the Advancement of Space Safety, 17-19 October 2011, Paris, France

– Space Environmental Conditions at the Time of the Galaxy 15 Anomaly (Oral), J.M. Kunches, **W. Denig**, **J. Green**, **D. Wilkinson**, **J. Rodriguez**, H. Singer, P. Loto'aniu, W. Murtagh and D. Biesecker

Low-Latititde Ionospheric Sensor Network, 06 November 2011, Sao Jose Dos Campos, Brazil

– Advanced Ionospheric Sounding with Vertical Incidence Pulsed Ionospheric Radar (Invited Oral) - T.W. Bullett.

Hokkaido University, 08 November 2011, Hakodate, Japan

– Long term trends in satellite observed lit fishing boat activity, C.E. Elvidge

Ministry of Agriculture, Forestry and Fisheries (MAFF), 10 November 2011, Tsukuba, Japan

– Trends in fishing boat activity observed from space, C.E. Elvidge

National Institute for Advanced Industrial Science and Technology (AIST), 10 November 2011, Tsukuba, Japan

– Prospects for monitoring gas flares with ASTER data, C.E. Elvidge

Institute of Arctic and Alpine Research (INSTAAR) Noontime Seminar, 14 November 2011, Boulder, CO

– Aurora, Space Physics and Nighttime Lights of the World (Oral), **W.F. Denig**

2nd Low Latitude Ionospheric Sensor Network Workshop, 07-10 November 2011, São José dos Campos, Brazil

– Advanced Ionospheric Sounding with Vertical Incidence Pulsed Ionospheric Radar, **T. Bullett**

– Detection of Spread-F and foF2 values using Digisonde and VIPIR instruments, **P. Bhaneja** and **T. Bullett**

International School for Atmospheric Radars, 11-23 November 2011, Chung-Li, Taiwan

– High Frequency Radars and Ionospheric Sounding (Invited Lecture), T.W. Bullett

European Space Weather Week-8 (ESWW8), November 28 - December 02, 2011, Namur, Belgium

– Space Environmental Data and Information Available from U.S. Civilian Operational Space Weather Systems (Poster), **W.F. Denig** and **J.V. Rodriguez**

Issues & Summary

STP FY12 Presentations (YTD) – 46 (2 of 4)

Presentations (continued)

– New Measurements of Magnetospheric Particle Fluxes, Densities and Temperatures on GOES 13-15 (Poster), **J.V. Rodriguez**, **J.C. Green**, T. Onsager and H. Singer

American Geophysical Union (AGU) Fall Meeting, 05-09 December 2011, San Francisco, CA

– Equatorial electron flux pulsations correlated with ground-based pulsating aurora observations (Poster), SM13B-2038, Allison N. Jaynes, M. Lessard**, J.V. Rodriguez** and K.M. Rychert

– New Directions for the NOAA Solar and Terrestrial Physics Division (Poster), SM21A-1997, **W.F. Denig**

– Extreme Events in GOES Space Environment Monitor Data 1974 – 2011 (Poster), NG23A-1484, **D.C. Wilkinson** and **A.S. Sundaravel**

– Measured and Modeled O+ Upwelling at 800 km: Understanding the Dayside Asymmetry (Poster), SM31A-2093, **R.J. Red**mon, W.K. Peterson, L. Andersson and P.G. Richards

– Evaluation of Ovation Prime as a Forecast Model of Visible Aurora (Poster), SM31B-2101, **J.L. Machol**, **J.C. Green**, **R.J. Redmon**, R.A. Viereck and P.T. Newell

– Detailed Characterization of Substorm Dipolarization and Particle Injection from an Unprecedented Constellation of Geosynchronous Satellites (Poster), SM31B-2114, **J.C. Green**, H.J. Singer, T.G. Onsager**, J.V. Rodriguez**, **W.F. Denig**, **D.C. Wilkinson** and **J.L. Machol**

– National Trends in Satellite Observed Lighting: 1992–2009 (Oral, Invited), GC32C-03, **C.D. Elvidge**, P.C. Sutton, **K. Baugh**, **D.C. Ziskin**, **T. Ghosh** and **S. Anderson**

– The Unusual Response of the Magnetosphere to Solar Wind Conditions during the Galaxy 15 Substorm (Oral), SM32A-05, H.J. Singer, R.L. McPherron, **J.C. Green**, **J.V. Rodriguez** and **R.J. Redmon**

– Spatial Resolution and Detection Limit Considerations for Low Light Imaging of Urban Land Use Patterns (Poster), GC33B-1081, S. Anderson, **C. Elvidge** and P.C. Sutton

– Anatomy of a Radiation Belt Flux Dropout (Poster), SM41B-2026, J.F. Fennell, R.H. Friedel, **J.C. Green**, T.B. Guild and J.E. Mazur

– Modeling and Observations of the East-West Effect in Solar Energetic Particle Flux at Geosynchronous (Poster), SM31B-2103, Brian T. Kress and **J.V. Rodriguez**

– On the Relativistic Electron Injection Event in Early April 2010 (Poster), SM51B-2079, J.B. Blake, P. Obrien, **J.V. Rodriguez and J.C. Green**

– Comparison of Simulated and Observed Ring Current Magnetic Field and Ion Fluxes and ENA Intensity during the 5 April 2010 Storm (Oral), SM54A-08, M.W. Chen, C. Lemon, T.B. Guild, M. Schulz, A. Lui, A.M. Keesee, J. Goldstein and **J.V. Rodriguez**

American Meteorological Society, 22-26 January 2012, New Orleans, LA

– New Operational Algorithms for Charged Particle Data from Low-Altitude Polar-Orbiting Satellites (Poster), **J.L. Machol, J.C. Green**, **J.V. Rodriguez**, T.G. Onsager, **W.F. Denig** and **P.N. Purcell**

Issues & Summary
STP FY12 Presentations (YTD) – 46 (3 of 4)

Presentations (continued)

Geospatial Forum, Gurgaon, Haryana, India, 07-09 February 2012, Haryana, India

– Evaluating district-level income distribution for India using nighttime satellite imagery and other datasets (Oral), **T. Ghosh**, M. Chaturvedi, L. Bhandari, **C. D. Elvidge** and **K. E. Baugh**

LASP Friends of the Magnetosphere, 20 March 2012, Boulder, CO

– Upwelling to Outflowing Oxygen Ions at Auroral Latitudes during Quiet Times:Exploiting a New Satellite Database (Oral), **R.J. Redmon** and L.A. Peterson

Inner Magnetosphere Coupling II, 19-22 March 2012, Los Angeles, CA

- New data, research, and products from the NOAA satellite fleet (Poster), **J.C. Green**, **W. Denig**, **J. Rodriguez**, **J. Machol**, T. Onsager, **R. Redmon**, H. Singer and **D. Wilkinson**

Space Weather Workshop, 24-27 April 2012, Boulder, CO

- Satellite Meeting Overview (Oral**), J.C. Green**
- New Space Weather Particle and Magnetic Field Products at NGDC (Poster**), R.J. Redmon**, **J. Green**, **W. Denig**, **J. Darnel**, **J. Machol**, **J. Rodriguez**, **W. Rowland**, **M. Shouldis** and **D. Wilkinson**
- Implementation of Space Environmental Anomalies Expert System Real Time (Poster), **J. Darnel**, **J. Green** and **W. Denig**
- Identifying Space Weather Events Using a Multichannel Statistical Classifier (Poster), E.J. Rigler, S.M. Hill, J.L. Gannon, A.A. Reinard, R.A. Steenburgh, **J.M. Darnel** and J. Vickroy
- Electron Observations at GEO During the High Speed Stream (HSS) Commencing on January 6th 2011 (poster), D. P. Hartley, M. H. Denton, **J. C. Green**, T. Onsager, **J. V. Rodriguez** and H. J. Singer
- Geomagnetic Cutoffs at Synchronous Altitude Revisited (poster), B. T. Kress and **J. V. Rodriguez**

CIRES Science Rendezvous, Boulder, CO, 24 April 2012

- Evaluation of Ovation Prime as a Forecast Model for Visible Aurorae (Poster), **J. Machol**, **J. Green**, **R. Redmon**, Rodney Viereck and Patrick Newell
- Auroral forms that extend equatorward from the persistent midday aurora during geomagnetically quiet periods' (poster), **J.V. Rodriguez**, H. C. Carlson, Jr., and R. A. Heelis
- NGDC's first foray into CLASS: the transition of data archive and stewardship into an external archival facility (Poster), **F. Coloma**, **R. Prentice** and **P. Elespuru**

Issues & Summary

STP FY12 Presentations (YTD) – 46 (4 of 4)

Presentations (continued)

GOES Science Week, 30 April – 04 May 2012, Kansas City, MO

- GOES-R Space Weather L2+ Algorithm Development (Oral & Poster), W.F. Denig

Geospace Environment Modeling (GEM), 17-22 June 2012, Snowmass, CO

- Dynamic Auroral Boundaries using DMSP (oral), **R.J. Redmon**, W.K. Peterson and L.A. Andersson
- Auroral forms that extend equatorward from the persistent midday aurora (oral**), J. Rodriguez** and C. Valladares
- Upwelling to Outflowing O+ (poster), R.J. Redmon, W.K. Peterson, L.A. Andersson and P.G. Richards
- Undulations in MeV Solar Energetic Particle Fluxes in Earth's Magnetosphere Associated with Substorm Magnetic Field Reconfigurations (poster), **J. Rodriguez**
- New Space Weather Auroral, Particle and Magnetic Field Products at NGDC" (poster), **R.J. Redmon**, **J. Green**, **W.F. Denig**, **J. Darnel**., **J. Machol**, **J. Rodriguez**., **W. Rowland**, **M. Shouldis**, and **D. Wilkinson**

ftp://ftp.ngdc.noaa.gov/STP/publications/stp_presentations/stp_presentations.pdf

Issues & Summary

Solar & Terrestrial Physics Division

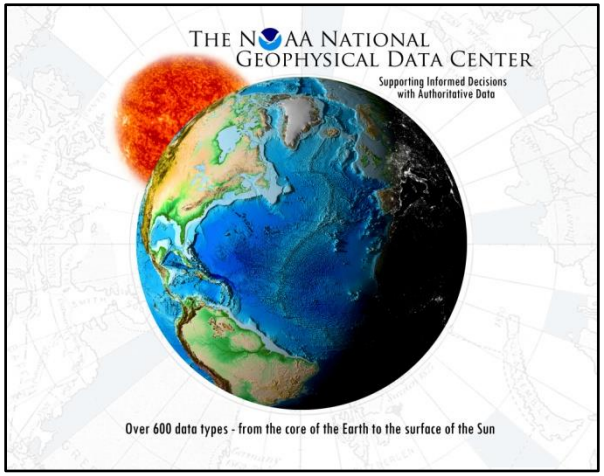
- ✓ **Fed hiring restrictions having mission impacts (3QFY12) – *active***
- ✓ **GOES-R L2+ SWx algorithms (3QFY11) – *active (on-going discussions)***
- Loss of key personnel has a severe mission impact (3QFY10) - *NLAI*
- Satellite processing transition from SWPC (4QFY09) – *DOA/NLAI*
- Continuity of solar data services (1QFY09) – *NLAI*
- *Refocus of NWS/SWPC Objectives (2QFY08) – NLAI*
- ✓ **NightSat Mission Concept (1QFY08) – *not selected – NLAI***

Metrics (FY12 - YTD)

Papers Published: 13

Presentations: 46

Bulletins: 6



NLAI – No Longer An Issue

QUESTIONS?